setting, the 'disentangling' process which Feynman describes as the central problem of his time-ordered calculus. Possible extensions of the concept of Feynman diagram are suggested.

The Limit Theorem for Collision Path

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Let $\{x_k\}$, $k=\pm 1, \pm 2, \ldots$, be a Poisson point process on the real line with parameter 1, to which we add the origin $x_0=0$, i.e.

$$\cdots < x_{-2} < x_{-1} < x_0 = 0 < x_1 < x_2 < \cdots$$

Then $\{\zeta_k = x_k - x_{k-1}\}$, $-\infty < k < \infty$, is an i.i.d. random sequence with the exponential distributions of mean one. For each k, we consider a random motion $x_k(t)$ starting from x_k. Suppose that $\{x_k(t) - x_k\}$, $-\infty < k < \infty$, is an independent system of random processes whose probability laws are identical with $x_0(t)$. Then we can define the collision path $y_0(t)$ by

$$y_0(t) = \lim_{n\to\infty} \text{median of } \{x_k(t);\ -n \leqslant k \leqslant n\} \quad \text{for } t \geqslant 0.$$

We will discuss the limiting behavior of the collision path by taking a suitable space-time scaling. In particular it will be shown that, as far as the convergence of finite dimensional distributions is concerned, the limiting behavior of the collision path is completely determined by asymptotic behavior of the first order absolute moments of the increments of $x_0(t)$. Moreover for a certain class of processes with stationary increments we will prove that the rescaled process of the collision path $y_0(t)$ converges to a fractional Brownian motion in the sense of weak convergence of probability distributions on the path space.

A Classical Derivation of Dirac's Equation

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A classical variational derivation of Dirac's equation, using analytic continuation, is presented. It is obtained by maximizing the path probability under the subsidiary condition that the probability density retains its correct quantum mechanical definition. The path probability for this nonclassical path of relative maximum likelihood is related to the path probability of the classical time-reversed solution to the absolutely most probable path, satisfying the telegrapher's equation, in the same way as the wave amplitude is related to the probability density. The generalization to three space dimensions is given. Two limiting situations are discussed which involve dynamic equilibria between the 'osmotic pressure' force and a virtual external force, proportional to the fluctuating velocity, and a force, equal to the rate of change of the momentum. The first is related to the diffusion or nonrelativistic limit while the second is related to relativistic particles with zero spin.